SB 297 Mapping Sand and Gravel Resources in Montana

Gravel **quality**, **quantity**, and **accessibility** are the main controls on the development of gravel pits.

The **quality** of gravel is determined by the lithology or types of rocks that make up the gravel as well as the grain-size distribution (sorting) within the deposit.

Materials such as shale, siltstone, or certain volcanic rocks make for poor quality gravel because of physical properties and/or potential for undesirable chemical reactions.

Well-indurated limestone and quartz-rich sediments and some types of coarse-grained igneous rock make for high-quality gravel.

The **quantity** or total volume of gravel must be sufficient to warrant the investment of equipment and infrastructure to sustain a sand and gravel operation.

Accessibility includes a variety of issues:

the deposit must be at or near the surface;

transportation distance: costs are generally a major factor in cost of gravel; adding a few miles to the haul distance will greatly increase the delivered cost of the gravel.

relative location: gravel deposits in riparian areas, adjacent to subdivisions, etc. are likely to run into opposition for development.

deposit thickness: the 3-dimensional shape of a gravel deposit also affects potential for development; a 5-foot thick deposit obviously requires much more surface disturbance than a 50-foot thick deposit in order to produce the same amount of product.

SB297 will:

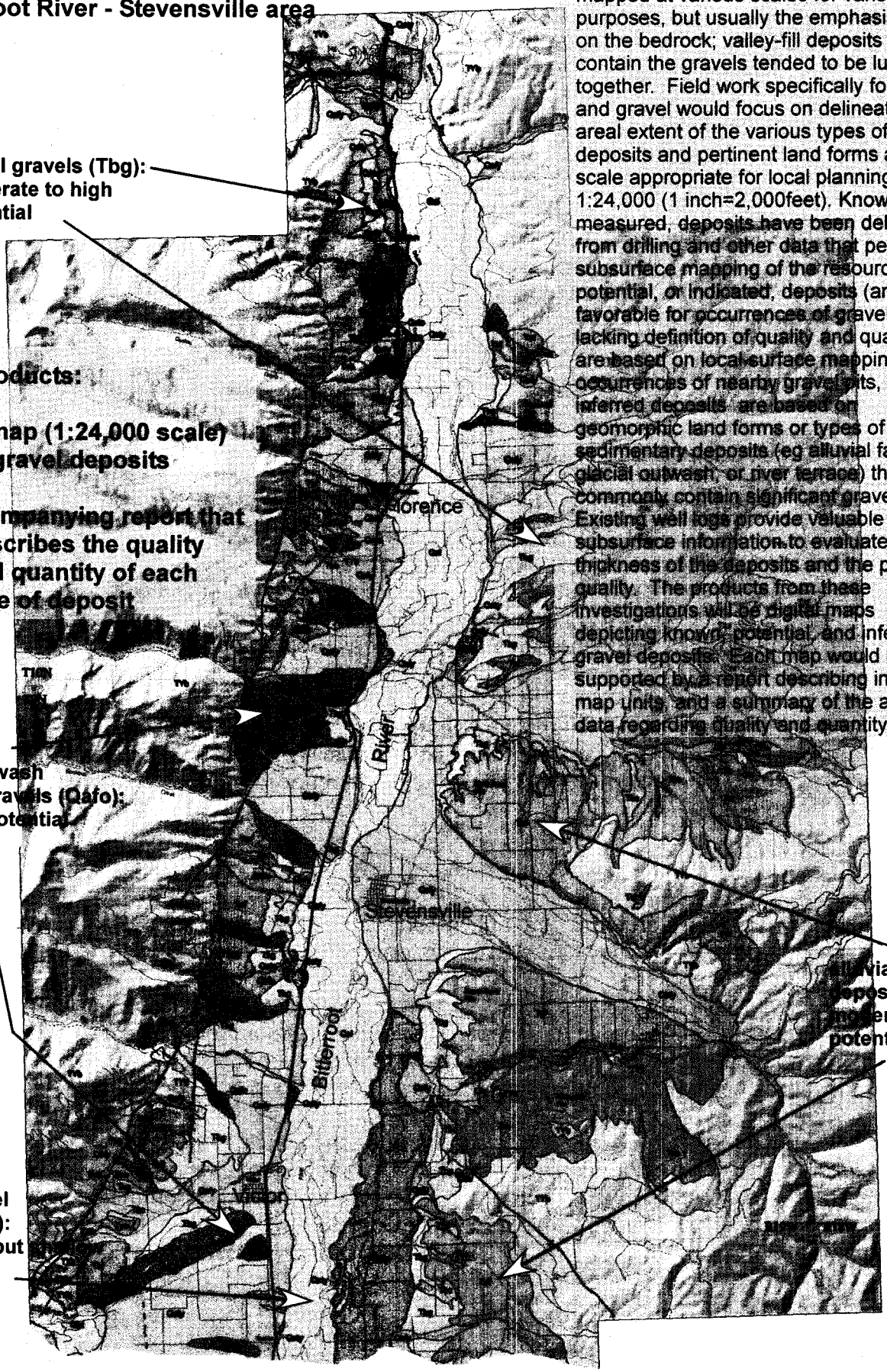
a) establish a Sand and Gravel Deposit Program within the Montana Bureau of Mines and Geology (MBMG) to systematically investigate Montana's sand and gravel resources,

b) establish an account to accept "gifts, grants, reimbursements, allocations from any source, and any interest earned" for the purpose of conducting investigations, and

c) have the MBMG present the results of each investigation to
(1) the counties included in the investigation;
(2) the Education and Local Government Interim Committee; and
(3) the Environmental Quality Council.

SB297 poses no fiscal impact to general funds

Sand and Gravel Deposits
Bitterroot River - Stevensville area



fluvial gravels (Tbg): moderate to high potential

SB297 products:

> digital map (1:24,000 scale) of gravel deposits

> an accompanying report that describes the quality and quantity of each type of deposit

alluvial outwash sand and gravels (Qafo): moderate potential

active channel deposits (Qal): high quality, but ground water

alluvial fan deposits(Taf): moderate to low potential

The geology of Montana has been mapped at various scales for various purposes, but usually the emphasis was on the bedrock; valley-fill deposits that contain the gravels tended to be lumped together. Field work specifically for sand and gravel would focus on delineating the areal extent of the various types of gravel deposits and pertinent land forms at a scale appropriate for local planning: 1:24,000 (1 inch=2,000feet). Known, or measured, deposits have been delineated from drilling and other data that permits subsurface mapping of the resource: potential, or indicated, deposits (areas favorable for occurrences of gravel, but lacking definition of quality and quantity) are based on local surface mapping or occurrences of nearby gravel pits, and inferred deposits are based on geomorphic land forms or types of sedimentary deposits (eg alluvial fan, glacial outwash, or river terrace) that commonly contain significant gravels. Existing well logs provide valuable subsurface information to evaluate the thickness of the deposits and the potential quality. The products from these investigations will be digital maps depicting known, potential, and inferred gravel deposits. Each map would be supported by a report describing individual map units, and a summary of the available data regarding quality and quantity.